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10/522,976	02/01/2005	Radivoje Popovic	6305-0009WOUS	6655
35301	7590	03/01/2007	EXAMINER	
MCCORMICK, PAULDING & HUBER LLP			WHITTINGTON, KENNETH	
CITY PLACE II			ART UNIT	PAPER NUMBER
185 ASYLUM STREET			2862	
HARTFORD, CT 06103				
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/01/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/522,976	POPOVIC ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Kenneth J. Whittington	2862	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 31 January 2007.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 12-15 and 18-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 12-15 and 18-33 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 01 February 2005 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                         | 5) <input type="checkbox"/> Notice of Informal Patent Application                         |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ . | 6) <input type="checkbox"/> Other: _____ .  |

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**DETAILED ACTION**

The Amendment and Remarks filed January 31, 2007 have been considered. In view thereof, the rejections applying Berkan (US6750644) and Extance et al. (US4692703) individually have been withdrawn.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 12-15 and 18-33 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: the particular location of the sensors. As noted in the specification, the "Hall elements 10 to 13 are always arranged underneath the ferromagnetic core" (See Spec. at paragraph 0025). However, this feature, which as noted in this paragraph, is essential and further is not contained or implied in the claims. Therefore, the claims are missing an essential element.

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***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 12, 18, 21 and 29 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 3 of U.S. Patent No. 7,038,448 in view of Tong et al. (US5,199,178), hereinafter Tong. Regarding claims 11, 18, 21 and 29 of the present application, claims 1 and 3 of '448 teaches all the features of the present application including a core having inner and outer edges, but does not specifically recite the core being ring shaped. Tong

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teaches using a ring-shaped core in a magnetic field measuring apparatus (See Tong FIG. 1, note ring core). It would have been obvious at the time the invention was made to incorporate a ring-shaped core into the recited apparatus of '448. One having ordinary skill in the art would have been motivated to do so because as noted in Tong, such core is the most common configuration of a core in such magnetometers and provides a sensor with good sensibility and simple in construction and design (See Tong col. 1, lines 31-63).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 12-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Tong et al. (US5199178), hereinafter Tong.

Regarding claims 12 and 29, Tong discloses a magnetic field sensor and method for the measurement of at least one component of a magnetic field, comprising

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a ring-shaped ferromagnetic core attached to a semiconductor chip that spans a plane with the at least one component of the magnetic field to be measured and that serves as magnetic field concentrator, whereby the ferromagnetic core is magnetized with a predetermined magnetization (See Tong FIG. 10 and col. 5, lines 23-44, note substrate with core and excitation coil CC which is energized by a pulse generator to create a predetermined magnetic field during such pulse).

a read-out sensor, whereby the read-out sensor comprises at least one sensor that is integrated into the semiconductor chip and arranged in the vicinity of an outer edge of the ferromagnetic core and that measures the at least one component of the magnetic field (See FIG. 10, note coils CX and CY), and an excitation coil and an electronic circuit for the temporary application of a current to the excitation coil in order to restore the predetermined magnetization in the ferromagnetic core (See FIG. 10, note coil CC and see col. 5, lines 23-44, note that the measurement is taken each time the coil is energized, i.e., during a pulse from the pulse generator, each pulse being a temporary current application. At each pulse, the coil is energized which returns the core to the predetermined magnetization).

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Regarding claims 13 and 32, Tong discloses the ferromagnetic core is circularly magnetized (See FIG. 10, note structure of coil CC).

Regarding claims 14 and 15, Tong discloses the excitation coil comprises at least one winding that encloses the ring of the ferromagnetic core (See FIG. 10).

Regarding claim 30, Tong discloses the current applied to the excitation coil for restoring the magnetization of the ferromagnetic core is a direct current pulse, whereby a maximum of the direct current pulse produces a magnetic field that is greater than a coercive field strength of the material of the ferromagnetic core (See col. 5, lines 23-44, note a pulse generator would create a field greater than the coercive field strength of the material).

Regarding claim 33, Tong discloses the ferromagnetic core is circularly magnetized (See FIG. 10, note structure of coil CC).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 12-15, 18-23, 29, 30, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Extance et al. (US 4692703) in view of Tong. Regarding claims 12 and 29, Extance teaches a magnetic field sensor comprising:

a ring-shaped ferromagnetic core attached that spans a plane with the at least one component of the magnetic field to be measured and that serves as magnetic field concentrator, whereby the ferromagnetic core is magnetized with a predetermined magnetization (See Extance FIGS. 5, note core 20, note also that the coil provides a calibration current to provide an alternating current to the coil which causes a temporary predetermined magnetization, see also FIG. 3, item 15.

For example, the magnetization caused by a peak in the AC current can be interpreted as a predetermined magnetization),

a read-out sensor, whereby the read-out sensor comprises at least one sensor that is integrated into the semiconductor chip and arranged in the vicinity of an outer edge of the ferromagnetic core and that measures the at least one component of the magnetic field (See FIGS. 5, items A and A'), and

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an excitation coil and an electronic circuit for the temporary application of a current to the excitation coil in order to restore the predetermined magnetization in the ferromagnetic coil (See FIGS. 5, coil 14 and circuit shown, note that during operation, the coil is alternatively energized which restores the predetermined magnetization during measurement, i.e., the peak of the waveform is periodically restored and the valley of the waveform is periodically restored).

However, Extance does not explicitly teach the core with coil thereon being mounted to a substrate. Tong teaches mounting a core and coil arrangement onto a substrate (See Tong FIGS. 3 and 10). It would have been obvious at the time the invention was made to mount the core and coil of Extance onto a substrate as taught by Tong. One having ordinary skill in the art would have been motivated to do so because there would necessarily be some mounting arrangement used in Extance and Tong provides a means by which to mount such cores and coil to a substrate to position the coils with great accuracy and maintain alignment of the various components (See Tong col. 3, line 5 to col. 4, line 50).

Regarding claims 13 and 32, the noted combination teaches the ferromagnetic core is circularly magnetized (See Extance FIG. 5, note orientation of coil to core).

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Regarding claims 14 and 15, the noted combination teaches the excitation coil comprises at least one winding that encloses the ring of the ferromagnetic core (See Extance FIGS. 3-5, items 14 and core 20).

Regarding claims 18, 19 and 20, the noted combination teaches the read-out sensor comprises at least one Hall element (See Extance FIGS. 3-5, items A and A').

Regarding claims 21, 22 and 23, the noted combination teaches two Hall elements arranged at diametrically opposite locations in the relation to an axis of symmetry of the core (See Extance FIG. 5, note sensor A and A').

Claims 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Extance in view of Tong. Regarding these claims, this noted combination teaches all the feature of the claims except for the particular dimensions. Nonetheless, modifying this combination to have the relative dimensions as recited in the claims would be obvious to one having ordinary skill in the art through routine experimentation because where the where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. See

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*Gardner v. TEC Systems, Inc.*, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 225 USPQ 232 (1984). Because this noted combination teaches the general features of the claims, it teaches the relative dimensions recited in the claims.

Claims 24, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tong. Regarding these claims, Tong teaches all the feature of the claims except for the particular dimensions. Nonetheless, modifying Tong to have the relative dimensions as recited in the claims would be obvious to one having ordinary skill in the art through routine experimentation because where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. See *Gardner v. TEC Systems, Inc.*, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 225 USPQ 232 (1984). Because Tong teaches the general features of the claims, it teaches the relative dimensions recited in the claims.

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**Allowable Subject Matter**

Claim 31 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 31, the prior art does not teach alternatively providing DC pulses to the core via the coil in opposite directions and summing the output signals therefrom, in combination with the other features of the claims.

**Response to Arguments**

Applicant's arguments filed in the Amendment and Remarks with respect to the rejections under 102 applying Extance and Berkam individually have been fully considered and are persuasive. The rejections applying these references therefore have been withdrawn. However, the Double Patenting rejections remain as well as the new rejections noted above.

Regarding the Double Patenting rejection, Applicants have asserted that because the '448 patent is directed to a fluxgate, it cannot teach the noted features of the present claims. However, as recognized by Applicants, '448 teaches applying an

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AC current to the coil, which effectively brings the magnetization of the core to a predetermined magnetization, reverses polarity to another magnetization and returns or restores the predetermined magnetization, all occurring with the changing current. Accordingly, while the invention in the '448 patent and Applicants' invention may be different in operation, the claims are not so limited and the rejections stand.

Regarding Applicants' assessment of Extance in response to the prior withdrawn rejections, Applicants' have similarly noted that Extance is directed to a fluxgate magnetometer. For similar reasons, the combination using Extance, while operating as a fluxgate, reads on the claims as noted above.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth J. Whittington whose telephone number is (571) 272-2264. The examiner can normally be reached on Monday-Friday, 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the

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organization where this application or proceeding is assigned is  
571-273-8300.



Kenneth J Whittington  
Examiner  
Art Unit 2862

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